Mr. R. H. Sullivan, Observer, Grand Junction, Mesa County, Colo., gave an exposition of meteorological apparatus and work before the class in physics of the local high school on March 18.

Mr. Bernard Bunnemeyer, Observer, Pensacola, Fla., delivered a series of lectures on meteorology before the three higher grades of public school No. 1 every alternate day during March. At the conclusion of the course the classes went to the Weather Bureau office in sections, and received instruction in the practical workings of the Bureau.

The pupils of the section on physiography of the State Normal School at Duluth, Minn., visited the office of the Weather Bureau February 25, and received instruction from Mr. H. W. Richardson, the local forecaster.

Mr. H. W. Grass, Assistant Observer, Moorhead., Minn., reports that on January 29 and February 9 the classes of the State Normal School, under Prof. H. M. Sanford, visited the office of the Weather Bureau and received instruction.

Mr. R. Q. Grant, Observer, La Crosse, Wis., reports as follows: January 15, a lecture on weather forecasting for the Nineteenth Century Club. Instruction in instruments and forecasting, February 17 and 18 for the scientific class of the La Crosse High School. March 9, lecture on weather signs, folklore, and the long-range forecasts in the almanacs, in Campbell, for the La Crosse County Agricultural and Horticultural Society. According to the local newspapers—

> He not only gave a talk on the signs of the weather, but answered a continuous volley of questions, and was thus able to make the interview most instructive to all. Many of the farmers stoutly held out for the importance of folklore, but the weather man waged war ruthlessly, turning aside one argument after another, but giving due credit to those adages in which there is a foundation of fact. Belief in the ground hog, rheumatism, and the moon as weather indicators seems to have been effectually quashed.

March 15, explanation of Weather Bureau methods, at the Weather Bureau, for the Young Men's Club.

Mr. W. L. McKay, Assistant Observer at New York, reports that he has delivered public lectures on the Weather Bureau and meteorology as follows:

December 14, before the Chautauqua Circle of West Nyack.

December 18, February 15 and 25, in public school buildings, for the Board of Education of New York City.

March 4, before the Commonwealth Council of the Royal Arcanum, in Brooklyn, N. Y.

February 4, in Brooklyn, before an audience of several hundred school children and their parents. Mr. McKay sketched the history of the Bureau from its foundation, and explained the data on the weather map, detailing the methods by which reports are received and forecasts made. The lecture was illustrated with more than 100 lantern slides, and this method of illustration was used freely in all of the lectures.

Mr. Charles Stewart, Observer, Spokane, Wash., on April 19 lectured to 50 advanced pupils and their teachers at Brunot Hall, a school for young ladies, on "Weather changes and their causes." He also lectured to the 70 pupils of the physical geography class of Spokane High School, on meteorological instruments and kindred subjects. The class was divided into three sections and visited the local Weather Bureau office on April 27, 28, and 29.

METEOROLOGY IN THE UNIVERSITIES.

According to a copy of the Colorado Springs Daily Telegraph, Prof. H. F. Loud of Colorado College has been greatly encouraged by the gifts of General Palmer for the science of meteorology. An observing station has been completely equipped on the roof of Hagerman Hall, and there seems to be every prospect that this important station and its still more important mountain station on the summit of Pikes Peak will hereafter be occupied, and will afford the data for important researches. There are very few points in the world that lend themselves to the investigation of the atmosphere better than do Pikes Peak, Manitou, and Colorado Springs. In such work Colorado College may be expected to take an active part. Perhaps the first difficulty consists in the establishment and maintenance of continuous self registers at the college station, and this seems to have already been accomplished. We can but wish ultimate success to all the schemes in which Professor Loud is engaged for the benefit of research in meteorology.

We believe we have not before put on record the fact that a comprehensive course in meteorology is conducted by Prof. H. V. Egbert at Buchtel College, Akron, Ohio. It is an elective study in the department of mathematics, astronomy, and meteorology during the first half year, and occupies four hours each week. The course is thus described in the last circular of information:

> *Meteorology* (Waldo).—A study of temperature, air pressure, winds, clouds, moisture, precipitation, atmospheric optics, and electricity; general, secondary, and special circulations of the atmosphere, weather and weather prediction, general climate and climate of the United States. In addition to the theoretical work the class will be required to conduct a series of meteorological observations after the methods of the United States Weather Bureau.

A new Weather Bureau station will be established about July 1 at Madison, Wis. It is hoped that the station will be located on the grounds of the University, and that a proper meteorological observatory will be built. Mr. James L. Bartlett, Observer, Weather Bureau, New York City, is designated as the observer in charge of the new station, and it is hoped that he will be able to give some instruction in meteorology at the University.

THE OBSERVATORY AT NICE.

The observatory at Nice, founded by R. Bischoffsheim, the wealthy banker of Paris, has suffered a severe loss in the death of its director, H. Perrotin. As his successor, General Bassot has been appointed. He is president of the International Geodetic Association and member of the Institute of France. As vice director, Mr. Simonin, who has hitherto been senior astronomer, has been appointed. Although the observatory is distinguished for its work in astronomy, yet it also cultivated meteorology and terrestrial magnetism.

HYPOTHESES AS TO THE CAUSE OF THE AURORA BOREALIS.

Referring to the hypotheses recently published by Mr. Charles Nordmann as to the cause of the aurora borealis (see MONTHLY WEATHER REVIEW, March, 1904, Vol. XXXII, p. 132), we note that in the Meteorologische Zeitschrift for April, Dr. T. H. Arendt, of the Central Meteorological Institute in Berlin, writes as follows:

> Considering the fact that, especially in recent times, many persons have again labored to find some connection between the variable frequency of the sun spots, the variation in the solar activity, and the periodicity of certain meteorological elements, it may be proper to mention certain results of observations that Dr. Nordmann has himself brought together with great care.

The occurrence of solar eclipses has afforded opportunity for observations showing a close connection between the frequency of sun spots and the characteristic processes in the solar corona. At the time of sun-spot minimum the coronal streamers are especially frequent in the neighborhood of the solar equator, where they appear radial to the solar disk and with very considerable extension outward; as we approach the sun's pole their dimensions diminish and they curve toward the equator. During a sun-spot maximum these streamers are distributed more equally over the sun's disk and are everywhere smaller. Simultaneously the spectral lines of the gaseous components of the aurora are much brighter during sun-spot maxima and observable to a much greater distance from the sun's limb than during sun-spot minima. According to Nordmann, this gaseous layer in the sun's atmosphere receives its ability to send us light by its absorption of Hertzian waves. Furthermore, with reference to meteorologico-magnetic relations, Nordmann has made a brief summary that enables him to draw conclusions as to the velocity with which disturbances in the sun are transmitted to terrestrial conditions. For instance, in five well-known cases simultaneous observations as to the sudden occurrence of solar eruptions and magnetic disturbances show that the passage from the sun to the earth must take place with the velocity of light. Again, in another place Nordmann collects data from which it follows that the occurrence of a magnetic disturbance is simultaneous with the passage of a sun spot through the central meridian in only the rarest possible number of cases. These two latter results would certainly seem likely to entirely overthrow the hypotheses that refer the origin of auroras to the direct cathodic radiation from the sun. But, on the contrary, arguing from the experiments by Lenard, J. J. Thomson, Ebert, and Wiedemann, Nordmann is rather inclined to the idea that Hertzian waves proceeding from the sun do cause the auroras in our atmosphere.

It is well known that as early as 1896 Scheiner and Wilsig endeavored to solve the question whether energy comes to us from the sun in the form of electro-dynamic radiation; the measurements carried out in Potsdam led to no positive results. On the other hand, the occurrence of the great sun spot of October 31, 1903, which was accompanied by a great aurora and a remarkable magnetic disturbance, brought about no Hertzian waves in the lower strata of the atmosphere, as we know from the fact that the atmospheric or wireless telegraphy was not interfered with to any appreciable extent. In consideration of the fact that J. J. Thomson has suggested that the Hertzian waves would be absorbed to a large degree by the thin gases of our upper atmosphere, Nordmann decided to repeat the observations at much higher altitudes. Unfavorable weather prevented his work on the summit of Mont Blanc. It was, therefore, carried out in September, 1901, at the Bossons at an altitude of 3100 meters in accordance with the following method:

The receiver for the Hertzian waves consisted of a wire 5 millimeters in diameter and 175 meters long, isolated and so located on the earth that at midday the solar rays struck it normally to its length. The indicator for the possible Hertzian wave was a form of coherer that was placed inside of a vessel filled with quicksilver. The coherer was connected on the one hand with the above-mentioned wire receiver, and on the other hand with a well insulated wire inside the mercury; the wire led to a galvanometer and a LeClanche element, and then returned to contact with the mercury. If a Hertzian wave were present, a current would follow, but the experiments led to no decision.

According to Nordmann this was explained by the fact that at this time the sun had unusually few spots, and furthermore by the fact that at midday the altitude of the sun was too low. The author intends to repeat these observations in the course of the present year under more favorable conditions. The best chance for success would be to execute such observations during a high balloon voyage at the time of a great magnetic disturbance. It must surprise one that Nordmann did not delay the publication of his theory of the auroral light until he could obtain some more reliable basis for his ideas. The hypothetical character of his views is easily seen by the following simple statement of his train of thought.

Hertzian waves come from the sun; their intensity increases with the increased solar activity; in proportion to their intensity, they penetrate into our atmosphere to within 50 kilometers of the sea level and thus are absorbed, partly with the evolution of light; thereby the respective strata of air become electrically conductive, and if great potential differences exist electric currents are developed whose intensity varies with the physical conditions; the air that is made luminous gives occasion to the emanation of cathode rays which spread through space, thereby deciding the arrangement of the magnetic lines of force and the distribution of the electrostatic field. Rapid changes in the movement of the visible processes, namely the aurora, due to the absorption of the cathode rays in the air, are explained by the sudden changes, positive or negative, in the sign of the electrostatic field.

A more careful consideration of recent magnetic literature should have shown the author many objections, not only against the validity of his theory but also against his explanations of other magnetic questions.

CORRIGENDA.

MONTHLY WEATHER REVIEW for November, 1903, p. 526, column 2, line 4 above the second table, for "J. E. Keller" read "J. E. Keeler."

THE WEATHER OF THE MONTH.

By Mr. W. B. STOCKMAN, District Forecaster, in charge of Division of Meteorological Records.

PRESSURE.

The distribution of mean atmospheric pressure is graphically shown on Chart VIII and the average values and departures from normal are shown in Tables I and VI.

The mean barometer was generally high over the central and eastern districts and low over the southwestern. The crest of high mean pressure overlay Lake Superior, northern Minnesota, eastern North Dakota, and the contiguous Canadian territory. The area of low mean pressure overlay the middle and southern Plateau and slope regions, with the lowest mean readings reported from the upper Rio Grande Valley.

The mean pressure was below the normal in the Florida Peninsula and from central South Carolina northward over the lower Lake region and central New England, also in the north Pacific region; elsewhere it was above normal.

The negative departures were slight, not exceeding —.05 inch at any of the stations in the United States, while over the central half of the country from eastern Texas, northwestward and northeastward, the positive departures were quite marked and ranged from +.05 to +.16 inch, the maximum departure occurring in southeastern South Dakota.

Generally east of the eighty-seventh meridian, also in southern Arizona and extreme southern California, the mean pressure diminished from that of March, 1904; elsewhere it increased over March, 1904.

Over the eastern lower Lakes and the Atlantic States north of Georgia the minus changes were quite decided, ranging from —.05 inch in the southern and western portions of this area to —.15 inch over southern New England.

As a rule, the plus changes were greater than the minus. An area of changes amounting from +.10 to +.15 inch overlay the central slope districts, and a less extensive area, but with more decided changes, over the extreme northwestern districts, in which area the changes ranged from +.10 inch on the south and east to +.25 inch on the northwestern coast of Washington.

TEMPERATURE OF THE AIR.

The distribution of maximum, minimum, and average surface temperatures is graphically shown by the lines on Chart V.

Generally over the eastern two-thirds of the country and in interior California, Nevada, and western Arizona the temperature was below the normal.

Over almost the entire area where there was a deficiency in temperature the changes were marked, and ranged from —2.0° to —8.5°, the area of greatest deficiency overlaying the Ohio Valley, Tennessee, and the central Mississippi Valley, with the greatest changes in Missouri, where they ranged from —6.1° to —8.5°.

The plus departures were slight, and nowhere in the United States did they equal 4.0°. The previous highest mean temperature for the month of April since the establishment of the station was exceeded by 1° at Seattle and Tacoma, Wash., and by 4° at Lewiston, Idaho, and the lowest by 1° at Binghamton, N. Y., Fort Smith, Ark., Green Bay, Wis., Harrisburg, Pa., Lexington, Ky., Little Rock, Ark., Springfield, Ill., Sandusky, Ohio, Sioux City, Iowa, and Wichita, Kans.; by 2° at Columbus, Ohio, Concordia, Kans., and Evansville, Ind.; by 3° at